

REMARKS

Claims 1-22, 25, and 26 are all the claims presently pending in the application. Claims 23 and 24 have been canceled to expedite prosecution. There are no claim amendments, but a clean version of the claims are provided for convenience to the USPTO and for reference.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-18, 20-22, 25, and 26 stand rejected under 35 U.S.C. § 101 as allegedly directed to nonstatutory subject matter. Claims 1-18, 20, 22, 25, and 26 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by newly-cited US Patent Application Publication U.S. 2003/0220777 to Kitchen et al.

These rejections are respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

As exemplarily defined by independent claim 1, the claimed invention is directed to a predictive model method. An input data is received into an initial model to develop an initial model output. The input data and the initial model output is then received as inputs into a first boosting stage to develop an improvement to said initial model output.

As explained in the second full paragraph on page 18, the conventional methods of segmented regression using tree-based predictive modeling has a problem in that data is quickly exhausted in the method of dividing data into numerous subsets.

In contrast, the present invention provides a method that provides an accurate model that converges quickly even with limited amounts of data. A key feature of the present invention that permits it to overcome the deficiency of lack of data is the technique of providing, as an input into the second stage, both input data and the result of the first stage, thereby achieving a boost effect not present in the conventional method.

II. THE 35 USC §101 REJECTION

Claims 1-18, 20-22, 25, and 26 stand rejected under 35 U.S.C. §101 as allegedly directed toward nonstatutory subject matter. The Examiner alleges that the *“In particular claims 1-18, 20-22, and claims 25-26 are considered to be directed to software and in accordance with ... claims do not set forth any structure whereby the functionality of the software may be realized Furthermore, claims 1-18, 20-22, and 25-26 do no set forth a “useful, concrete and tangible result.” In particular, it is not considered that these claims set forth a tangible result. Claims 1-18, 20-22 and 25-26 do not produce a practical real world result. The Examiner takes the position that while, it is clear from applicant’s claims and disclosure, that the intended invention is a predictive modeling method. However, the applicant has failed to include an intended real world use (i.e., an application of the invention), a concrete result and tangible result (of the output).”*

In response, Applicant again submits that the basis of this rejection is still not clearly understood, since the above-recited statements are not the standard for statutory subject matter and seems to be contradictory. Rather, as described in the “Interim Guidelines”, statutory subject matter relates to a threshold evaluation of the invention as a whole, including the description of utility in the disclosure.

Moreover, as described in the specification, Applicant submits that claims 1-17 and 25-26 are directed to a process being executed on a computer, claims 18 and 19 are directed to an apparatus (e.g., a computer) executing the method of the invention, claims 20 and 21 are directed to Beauregard claims (e.g., a machine-readable medium having instructions tangibly embedded therein), and claim 22 is directed to a method of providing a service.

Relative to the apparatus and Beauregard claims (e.g., claims 18-21), these claims clearly have structural/functionality language and are, therefore, clearly directed to statutory subject matter.

Relative to the process claims, the relatively recent *State Street* and *AT&T* cases (as well as the “Interim Guidelines”) confirm that such claims are directed toward statutory subject matter if the result achieved is “useful, concrete and tangible”, and Applicant submits that data mining clearly provides such result, as described in the disclosure at, for example, the first

paragraph of page 2 through the third paragraph on page 3, wherein is mentioned non-limiting applications for direct-mail targeted-marketing, default on loans, insurance, and Internet advertising.

In the latest rejection wording, the Examiner states: *“The examiner takes the position that while, it is clear from applicant’s claims and disclosure, that the intended invention is a predictive modeling method. However, the applicant has failed to include an intended real world use (i.e., an application of the invention), a concrete result and tangible result (of the output).”*

As best understood from this statement, the Examiner is confusing a number of terms and is actually attempting to revise the current Guidelines as implying that independent claims must identify a specific application before the claimed invention is considered statutory subject matter.

Applicant respectfully disagrees and brings the Examiner’s attention to the following wording in Section IV.C of the Guidelines: *“While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be. In evaluating whether a claim meets the requirements of section 101, the claim must be considered as a whole to determine whether it is for a particular application of an abstract idea, natural phenomenon, or law of nature, rather than for the abstract idea, natural phenomenon, or law of nature itself.”* (emphasis in the Guidelines itself)

Thus, as best understood from the Examiner’s wording recited above, in view of the above-recited wording from the Guidelines, the real issue that seems to be on the Examiner’s mind is whether a “predictive modeling method” is itself a “real-world function” (as required by the Guidelines and as Applicant submits) or is merely an “an abstract idea” that is devoid of a real-world function until the independent claims recite that the predictive modeling method is applied to specific ones of the uses exemplarily identified in the disclosure (e.g., direct-mail targeted-marketing, default on loans, insurance, and Internet advertising).

In response, Applicant submits that the exemplary uses (e.g., direct-mail targeted-marketing, default on loans, insurance, and Internet advertising) identified in the disclosure are exemplary intended uses of the predictive modeling method and that intended uses are traditionally not considered by the USPTO as appropriate as the sole basis for patentability.

More important, Applicant respectfully submits that claimed predictive modeling method is itself the particular practical application or “real-world function” that the Guidelines require. That is, the specific method described by the present invention for predictive modeling, as implemented on a computer, receives actual real-world data related to an actual real-world problem and outputs a predictive model for that real-world problem. The present invention is, therefore, inherently not an abstract idea, even if it can be reasonably asserted that the claimed model method implements various combinations of abstract concepts and mathematical algorithms.

Stated slightly differently, even if the present invention can be said to rely upon various underlying abstract concepts, the present invention itself, as implemented in a computerized method, inherently implements these abstract concepts as concrete embodiments of these abstract ideas that receive actual data of a real-world problem and provides an actual model of that input data.

The present invention is not attempting to claim these underlying abstract ideas either in the abstract or outside the real-world function of predictive modeling.

Applicant respectfully submits that the underlying flaw of the Examiner’s position is that the Examiner improperly attempts to consider that a “predictive modeling method” is itself an abstract idea. Applicant respectfully disagrees.

That is, although the terminology “predictive modeling method” might be considered as an abstraction, the claimed invention is directed to a computerized implementation of a precise method, as defined by the steps of the method claims. As such, the claimed invention is no longer merely an abstraction, since it has been precisely defined, has been implemented by a computerized method, using real-world data and providing a real-world model of that data. The claimed invention is, therefore, no longer an abstraction of “predictive modeling methods” but rather, a precisely-defined, real-world implementation using real-world data.

As such, Applicant submits that the claimed invention is tangible (since it relates to a real-world function), concrete (since the precisely-defined steps will cause a computer to replicate the same results, given the same input data), and useful (since various exemplary intended uses were clearly discussed in the disclosure). Since the present invention has these three characteristics, the computerized method claims are clearly statutory subject matter, and

Applicant respectfully submits that there is no need to add an intended use of the method into the independent claims in order to convert the claimed invention into statutory subject matter.

As an analogy of the above analysis and the present statutory subject matter rejection, Applicant brings to the Examiner's attention the thousands of patents directed to data compression/decompression. There is no doubt that the terminology "data compression/decompression" can be considered as an idea in the abstract. However, there is also absolutely no doubt that, when a specific method is implemented, whether by software or hardware, the data compression/decompression method becomes "tangible", "concrete", and "useful", even if these methods rely upon underlying abstract concepts and mathematics. Similar to the present claimed invention, these underlying abstract concepts and mathematical techniques have been embodied to perform a real-world function, as required by the Guidelines.

Therefore, again, Applicant respectfully submits that the fundamental deficiency of the statutory subject matter of the present evaluation is that the claimed invention is not a "predictive model method" as an abstract idea. Rather, it is a real-world implementation on a computer of a specific embodiment of "predictive model methods", as defined by its unique combination of method steps. Moreover, since the claimed invention uses real-world data, it inherently provides a real-world model of that data, thereby providing a real-world function.

As a final point, it is brought to the attention of the Examiner that statutory subject matter is a question of law, not a question of fact. What that means is that, should the present invention be subject to litigation in the future or review of any decision by the USPTO Board, the Court will review this issue *de novo* and will give no deference whatsoever to the opinion of the USPTO, whether it be the opinion of this Examiner or of the Board. The Court will conduct its own evaluation of the issue of statutory subject matter.

In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

III. THE PRIOR ART REJECTION

The Examiner alleges that newly-cited Kitchen et al. (US Patent Publication No. 2003/0220777), teaches the claimed invention described by claims 1-18, 20, 22, 25, and 26.

Applicant respectfully submits, however, that there are elements of the claimed invention which are neither taught nor suggested by Kitchen.

Relative to the rejection for independent claims 1, 10, 18, 20, and 22, the Examiner relies upon the following description in paragraph [0011] (e.g. “ ... *if the initial data set is determined not to be representative, underrepresented data is appropriately replicated and the replicated data combined with the data in the initial data set so as to produce a resulting modified data set that is representative of the data population of interest.*”) as satisfying the language of these independent claims, as explained on page 16 of the Office Action.

Applicant respectfully disagrees.

Taking independent claim 1 as an example, the first limitation requires that first input data be received and a first initial model be provided as an output. In the above-recited description in paragraph [0011] there is clearly no initial model, since this description merely describes a modification of input data and has nothing to do with providing an initial model output.

The second limitation requires that the initial model output be provided as an input into a first boosting stage to develop an improvement to the initial model output. Since the description above in paragraph [0011] does not have an initial model output, it likewise would not have the suggestion to use this initial model output as an input into a boosting stage.

The Examiner also considers that the description of the recursive partitioning (RP) methodology described in paragraphs [0026-0030] of Kitchen is equivalent to the “boosting stage” of the independent claim language.

However, as explained in paragraph [0028] of Kitchen: “*With RP, the patterns are transformed into a binary decision tree, which allows the output to be interpreted easily. RP accomplishes this transformation by relying on a strategy that includes separation of the data into two groups. RP exhaustively analyzes all possible splits (e.g., break points for the data) and each split that has a higher purity (i.e., fewer mistakes) is retained.*”

Applicant submits that this description suffers from at least the same deficiency identified above. That is, in this description, there is no initial model output that is provided into a boosting stage to further refine the initial model. Moreover, the recursive partitioning method is clearly described as merely searching for all possible splits of the original data.

Applicant submits that this simple method of locating all possible splits of input data is clearly an entirely different concept from that of using data to develop a first model and then using the output of the initial model as an input into a boosting stage.

Moreover, it is noted that the CART recursive partitioning method is also cited in the specification of the present invention for the purpose of both pointing out the useful, concrete, and tangible results that are produced by such methods, and for pointing out deficiencies in the prior art that the present invention seeks to overcome.

Another point is that recursive partitioning is an example of segmentation-based modeling because recursive partitioning operates by segmenting input data into a plurality of data segments (i.e., via pairwise recursive partitioning -- recursively separating data into two groups, see Kitchen paragraph [0028]) and by constructing predictive models for each data segment. Therefore, all of the arguments presented in the response to the first office action regarding the distinctions between the present invention and segmentation-based modeling likewise apply to the case of recursive partitioning.

In particular, as previously argued, there is no equivalent concept of nor any mention of boosting stages in the prior segmentation-based modeling teachings of Pednault; likewise, there is no equivalent concept of nor any mention of boosting stages in the recursive partitioning teachings of Kitchen.

Therefore, Applicant submits that the method of Kitchen fails to satisfy the plain meaning of the claim language of the independent claims.

Hence, turning to the clear language of the claims, in Kitchen there is no teaching or suggestion of: “...receiving first input data into an initial model to develop an initial model output; and receiving second input data and said initial model output as inputs into a first boosting stage to develop an improvement to said initial model output, said second input data comprising one of said first input data, data not included in said first input data, and a combination thereof”, as required by independent claim 1. The wording of independent claims 10, 18, 20, and 22 is similar.

Relative to independent claim 25, the Examiner relies upon the description in paragraph [0092], as describing training sets, to be equivalent to the description in this claim. However, Applicant submits that, even if the training set and holdout set of paragraph [0092] were to be

considered as equivalent to folds, there is no suggestion in this paragraph to create successive models and/or to select among alternate model structures. Therefore, Applicant submits that the description in paragraph [0092] fails to satisfy the plain meaning of the claim language of claim 25.

Accordingly, Applicant respectfully submits that all independent claims are clearly patentable over Kitchen and that all dependent claims would likewise be patentable.

However, relative to the rejections for the dependent claims, Applicant provides the following additional remarks.

Relative to the rejections for claims 2, 3, 11, 12, the data preparation process in Kitchen is done only once. There is no suggestion to keep repeating this data preparation multiple times. Moreover, as pointed out above, this data preparation processing does not provide an initial model output.

Relative to the rejections for claims 4 and 13, Applicant respectfully submits that the description in paragraph [0014] is describing an entirely different concept from that of the claimed invention. That is, in Kitchen the two processes MARS and CARTS are actually parts of a single modeling exercise. There is no suggestion to use a boosting stage to improve an initial model output.

Relative to the rejections for claims 5 and 6, Applicant respectfully points out that the Examiner seems a bit confused in attempting to describe the initial data processing described in paragraph [0011] as an iterative process, let alone an iterative process that depends upon the MARS and CART modeling processing. The MARS and CART processing is done only once in Kitchen and is done only after the data set issues have been resolved.

Relative to the rejections for claims 7-9, Applicant respectfully submits that the description in paragraph [0064] of using holdout data for testing the validity of the trees is not related to an avoidance of overfitting. That is, overfitting occurs when modeling is done iteratively. In Kitchen only a single model is developed.

The holdout set of Kitchen is not used for avoidance of overfitting. Paragraph [0064] clearly states that "the method of modeling using MARS and CART is conducted on the training set only," and it is at the point of modeling that overfitting can take place. As pointed out in Paragraph [0064], and as further confirmed in Paragraphs [0068] and [0093], the holdout set is

used only for testing purposes following modeling, it is not used by MARS and CART to produce the models. Because Kitchen uses holdout data sets for an entirely different purpose than in the present invention, these two uses of holdout sets cannot be equated.

Relative to the rejections for claims 14 and 15, Applicant respectfully submits that there is no suggestion in Kitchen to select from among alternative models.

Relative to the rejections for claims 16 and 17, Applicant respectfully requests that the Examiner point out specific line and column locations for each of the claim limitations.

Relative to the rejection for claim 26, Applicant respectfully submits that the same deficiency identified above for claim 1 applies to this rejection.

Therefore, Applicant submits that there are elements of the claimed invention that are not taught or suggest by the cited prior art, and the Examiner is respectfully requested to withdraw this rejection.

IV. FORMAL MATTERS AND CONCLUSION

In view of the foregoing, Applicant submits that claims 1-22, 25, and 26, all the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview.

Serial No. 10/727,578
Docket No. YOR920030072US1 (YOR.440)

The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 50-0510.

Respectfully Submitted,



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CERTIFICATION OF TRANSMISSION

I certify that I transmitted via EFS this Amendment under 37 CFR §1.116 to Examiner A. Kennedy on April 20, 2007.



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